

CLAIMS

1. A vacuum apparatus comprising:
 - a vacuum container having a gas inlet and a gas outlet;
 - a vacuum pump of at least one stage connected to said gas outlet of said vacuum container for depressurizing the inside of said vacuum container or maintaining the inside of said vacuum container in a depressurized state; and
 - a compressor connected to a discharge port of the last-stage vacuum pump of said at least one-stage vacuum pump and having capability of depressurizing an input side of said compressor.
2. A vacuum apparatus according to claim 1, wherein the number of vacuum pump stages is set to one stage or a plurality of stages depending on a gas amount introduced into said vacuum container.
3. A vacuum apparatus according to claim 1, wherein the number of vacuum pump stages is set to the plurality of stages.
4. A vacuum apparatus according to any one of claims 1 to 3, further comprising a gas recovery apparatus for recovering a gas discharged from said last-stage vacuum pump for re-use of said gas; and
 - wherein said compressor is a gas recovery compressor in said gas recovery apparatus.
5. A vacuum apparatus comprising a container to be depressurized having a gas inlet and a gas outlet, vacuum pumps of a plurality of stages connected to said container for depressurizing the inside of said container and maintaining the inside of said container in a depressurized state, and a gas recovery apparatus for recovering a gas discharged from the last-stage vacuum pump of said vacuum pumps for re-use of said gas;
 - wherein said vacuum apparatus further comprises a gas recovery compressor connected to a discharge port of said last-stage vacuum pump and having depressurization capability for assisting a depressurization operation of

said last-stage vacuum pump and suppressing back diffusion from said discharge port.

6. A vacuum apparatus according to claim 5, wherein a supply amount of a gas introduced into said container is smaller than a predetermined amount, and said last-stage vacuum pump is omitted, a gas discharged from the vacuum pump at the stage prior to the last stage being recovered and reused by said gas recovery apparatus, and said gas recovery compressor being connected to a discharge port of said vacuum pump at the stage prior to the last stage.

7. A vacuum apparatus comprising:

a container to be depressurized having a gas inlet and a gas outlet;

a first vacuum pump for maintaining the inside of said container to be depressurized;

a second vacuum pump connected at a subsequent stage of said first vacuum pump;

a third vacuum pump connected at a subsequent stage of said second vacuum pump; and

a compressor having depressurization capability and connected to said third vacuum pump.

8. A vacuum apparatus according to claim 7, wherein said first vacuum pump is a turbomolecular pump or a thread groove pump, and said second vacuum pump is a booster pump, said third vacuum pump being a dry pump.

9. A vacuum apparatus according to claim 7 or 8, further comprising a gas recovery apparatus for recovering a gas discharged from said third vacuum pump for re-use of said gas, wherein said compressor is a gas recovery compressor in said gas recovery apparatus.

10. A vacuum apparatus comprising:

a container to be depressurized having a gas inlet and a gas outlet and introduced with a gas in a supply amount smaller than a predetermined amount;

a first vacuum pump for maintaining the inside of said container to be depressurized;

a second vacuum pump connected at a subsequent stage of said first vacuum pump; and

a compressor having depressurization capability and connected to said second vacuum pump.

11. A vacuum apparatus according to claim 10, wherein said first vacuum pump is a turbomolecular pump or a thread groove pump, and said second vacuum pump is a booster pump.

12. A vacuum apparatus according to claim 10 or 11, further comprising a gas recovery apparatus for recovering a gas discharged from said second vacuum pump for re-use of said gas,

wherein said compressor is a gas recovery compressor in said gas recovery apparatus.

13. A vacuum apparatus according to any one of claims 1 to 12, wherein the vacuum pump connected to said compressor is a screw pump.

14. A vacuum apparatus according to any one of claims 1 to 13, wherein said compressor and the vacuum pump to which said compressor is connected are co-operated in series.